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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/552,262

10/05/2005

Kazuhide Hasebe

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EXAMINER

VINH, LAN

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/20/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/552,262	Applicant(s) HASEBE ET AL.	
	Examiner LAN VINH	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/21/2008 has been entered.

Response to Arguments

2. The applicants argue that the combination of Jeng et al (US 5,282,925) in view of Song et al (US 2004/0161890) and further in view of Demmin et al (US 6,635,185) fails to disclose that the chemical oxide film, removed by Applicants' methods, is formed as a protective film "after" the removal of a natural oxide film previously existing on the workpiece. This argument has been considered but is moot in view of the new ground(s) of rejection of claims 16-19 under 35 U.S.C 103(a) based on Nishino et al (5,030,319) Song et al (US 2004/0161890) and further in view of Demmin et al (US 6,635,185) since Nishino discloses removing an oxide layer "after" the removal of a natural oxide film previously existing on the workpiece (col 15, lines 10-16, col 16, lines 15-25)

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that

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any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

The applicants argue that none of the cited arts, teaches or suggests the claimed method steps because the claimed method steps increase throughput. This argument is unpersuasive because it is not in commensurate with the scope of the claims because none of the claims 16-19 recites the term "increase throughput"

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishino et al (US 5,030,319) in view of Song et al (2004/0161890) and further in view of Demmin et al (US 6,635,185)

Nishino discloses a method for oxide etching comprises the steps of: of removing a silicon dioxide film formed on a surface of a workpiece in a processing vessel that can be evacuated (col 10, lines 30-45), the silicon dioxide film being a chemical oxide film

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that has been formed by a chemical process (col 12, lines 25-34), the chemical oxide film having been formed as a protective film after a removal of a natural oxide film previously formed on the workpiece (col 12, lines 13-20), the chemical oxide film is removed under conditions that: a mixed gas containing HF gas and NH₃ gas is used (col 10, lines 30-45), a processing temperature for achieving etch selectivity for the chemical oxide film to silicon at 200°C (col 2, lines 58-61; col 8, lines 10-23; col 18, lines 15-20), the workpiece is processed in a processing pressure of 0.25 Torr (col 10, lines 18-23)

Unlike the instant claimed invention as per claim 16, Nishino fails to specifically disclose that the silicon dioxide film being a chemical oxide film that has been formed by a chemical process using a solution prepared by mixing H₂O₂ and NH₄OH

Song discloses a method for manufacturing a semiconductor device comprises the steps of forming an oxide layer via oxidation using H₂O₂ and NH₄OH, processing the workpiece at a pressure of 0.05 to 2 Torr (page 2, paragraph 0021, paragraph 0023)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Nishino method by forming the silicon dioxide using a solution prepared by mixing H₂O₂ and NH₄OH as conventional in the art as taught by Song

Nishino also fails to disclose the claimed flow rate ratio of HF to NH₃

Dennis teaches, beginning at col 7, lines 15

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As is well known, there are many operating conditions of a plasma etching process that can have an effect on the results obtained. These conditions include, for example, the type of plasma etching (for example, reactive ion etching, plasma etching, and high-density etching), etching composition flow rate, wafer temperature, pressure, power, time, and bias. The interrelationship of these parameters is a function of the hardware configuration and the material being etched. One skilled in the art of plasma etching and cleaning can vary these parameters accordingly to etch a desired material satisfactorily. Exemplary operating condi-

Since Nishino specifically discloses that the flow rates of the etchants vary (col 13, lines 55-57; col 18, lines 50-55) and the etching can be carried out over a wide range of chamber pressure (col 18, lines 5-10), one skilled in the art at the time the invention was made would have found it obvious to vary the flow rate of NH₃ and HF/the processing pressure in Nishino method in view of Dennis teaching because Dennis teaches that one skilled in the art can vary the parameter accordingly to etch a desired material satisfactorily (col 7, lines 23-25). It is also noted that "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)" see MPEP 2144.05 II B

4. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishino et al (US 5,030,319) in view of Song et al (2004/0161890) and further in view of Demmin et al (US 6,635,185)

Nishino discloses a method for oxide etching comprises the steps of: of removing a silicon dioxide film formed on a surface of a workpiece in a processing vessel that can be evacuated (col 10, lines 30-45), the silicon dioxide film being a chemical oxide film that has been formed by a chemical process (col 12, lines 25-34), the chemical oxide

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film having been formed as a protective film after a removal of a natural oxide film previously formed on the workpiece (col 12, lines 13-20), the chemical oxide film is removed under conditions that: a mixed gas containing HF gas and NH₃ gas is used (col 10, lines 30-45), a processing temperature for achieving etch selectivity for the chemical oxide film to silicon at 200°C (col 2, lines 58-61; col 8, lines 10-23; col 18, lines 15-20), the workpiece is processed in a processing pressure of 0.25 Torr /not more than 400 Torr (col 10, lines 18-23)

Unlike the instant claimed invention as per claims 17-18, 19, Nishino fails to specifically disclose that the silicon dioxide film being a chemical oxide film that has been formed by a chemical process using a solution prepared by mixing H₂O₂ and NH₄OH

Song discloses a method for manufacturing a semiconductor device comprises the steps of forming an oxide layer via oxidation using H₂O₂ and NH₄OH, processing the workpiece at a pressure of 0.05 to 2 Torr (page 2, paragraph 0021, paragraph 0023)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Nishino method by forming the silicon dioxide using a solution prepared by mixing H₂O₂ and NH₄OH as conventional in the art as taught by Song

Nishino also fails to disclose the claimed flow rate ratio of HF to NH₃

Dennis teaches, beginning at col 7, lines 15

As is well known, there are many operating conditions of a plasma etching process that can have an effect on the results obtained. These conditions include, for example, the type of plasma etching (for example, reactive ion etching, plasma etching, and high-density etching), etching composition flow rate, wafer temperature, pressure, power, time, and bias. The interrelationship of these parameters is a function of the hardware configuration and the material being etched. One skilled in the art of plasma etching and cleaning can vary these parameters accordingly to etch a desired material satisfactorily. Exemplary operating condi-

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Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAN VINH whose telephone number is (571)272-1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lan Vinh/
Primary Examiner, Art Unit 1792